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ABSTRACT

Guidelines are provided for financing a biomedical communications program. Included are: (1) a description of services that should be provided by such a program; (2) an organizational scheme for personnel, including job descriptions; (3) a proposed budget indicating categories of service, required personnel, and probable salaries; and (4) the results of a survey on funding practices. (EMH)

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financing a biomedical communications program

A Guide to Organizing and Financing a Biomedical Communications Program in HEALTH SCIENCE EDUCATIONAL INSTITUTIONS

by Sam A. Agnello

Director, Division of Audiovisual Education
Duke University Medical Center
Durham, North Carolina

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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The views expressed in the monograph are those of the author and do not necessarily reflect policies of the U.S. Department of Health, Education, and Welfare.

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About the Author. . .

Mr. Agnello received his A.B. degree in chemistry in 1939 from Duke University. He has been associated with Duke University Medical Center since 1941. His early experience in medical communication was with the production of teaching films with Dr. J. E. Markee in the Anatomy Department. In 1960, Mr. Agnello was project director for closed-circuit television in Duke's Department of Anatomy. In 1964, he was appointed Coordinator of Medical Television for the Medical Center. In 1966, the audiovisual communications facilities at Duke were reorganized into one entity, The Division of Audiovisual Education, with Mr. Agnello as Director.

Mr. Agnello is author and co-author of sixteen articles on medical communications and has been the editor of the HEALTH SCIENCES TV BULLETIN and the associate editor of VISUAL/SONIC MEDICINE. He is Secretary of the Health Sciences Communications Association, formerly the Council on Medical Television; chairman of the television committee of the Biological Photographic Association; and member of the Association of Medical Illustrators, the Association for Educational Communications and Technology, and the National Association of Educational Broadcasters.

INTRODUCTION

In order to serve properly the educational program of the health sciences institution, the director of the biomedical communications department should report to the chief educational administrative officer of the institution (see Figure 1). The budget for the biomedical communications program is a part of the total education budget and, consequently, a variety of systems can be employed in determining expenditures and cost-effectiveness of the communications effort.

A complete biomedical communications program will include art, photography, and television production; will service classrooms with these media; and will develop and evaluate communications programs. Art production will include drawings in all media, graphic art, and display design and execution. The photography section will supply still and motion pictures including specimen photographs, patient photographs, fundus photographs, graphic arts copy photography, slides in all formats, and prints in black-and-white and color. The television section will produce studio and remotely originated programs, both live and recorded.

The classroom services section will provide projectionists, projectors of all kinds, audiotape recordings, and playback of television programs. In addition, this section will schedule classrooms and other educational space for seminars, workshops, and educational-technical meetings. In some schools, classroom-laboratory scheduling is a responsibility of this section.

In a number of schools, the biomedical communications department works closely with the department of medical education to develop and evaluate educational communications methods. A close working relationship between the communications production department and the educational research and development department is an essential component of the newer curricula in health sciences schools.

Additionally, the biomedical communications endeavor must include the activities of the health sciences library. In most schools, the library is a separate entity at this time. However, growing interrelationships between audiovisual materials and the printed word necessitate close cooperation between the two. In at least one school, the policy has been established that nonprint media for individual study are handled by the library in close cooperation with the audiovisual department; nonprint media for group study are handled by the audiovisual department with cooperation by the library.

Among the developmental activities of the biomedical communications department is that of training workers in the field. Chapter 7 of Part II, Volume 46, of the *Journal of Medical Education* discusses manpower needs in the areas of educational technology and biomedical communications. This report recommends that each department of biomedical communications train some portion of its technical staff. Because fully trained technicians are rarely available for every departmental function, well-organized on-the-job training programs to upgrade semiskilled employees have proved to be both feasible and economically justifiable. New professionals likewise benefit from on-the-job experience, and a good communications department will provide internship programs for graduates of professional training programs.

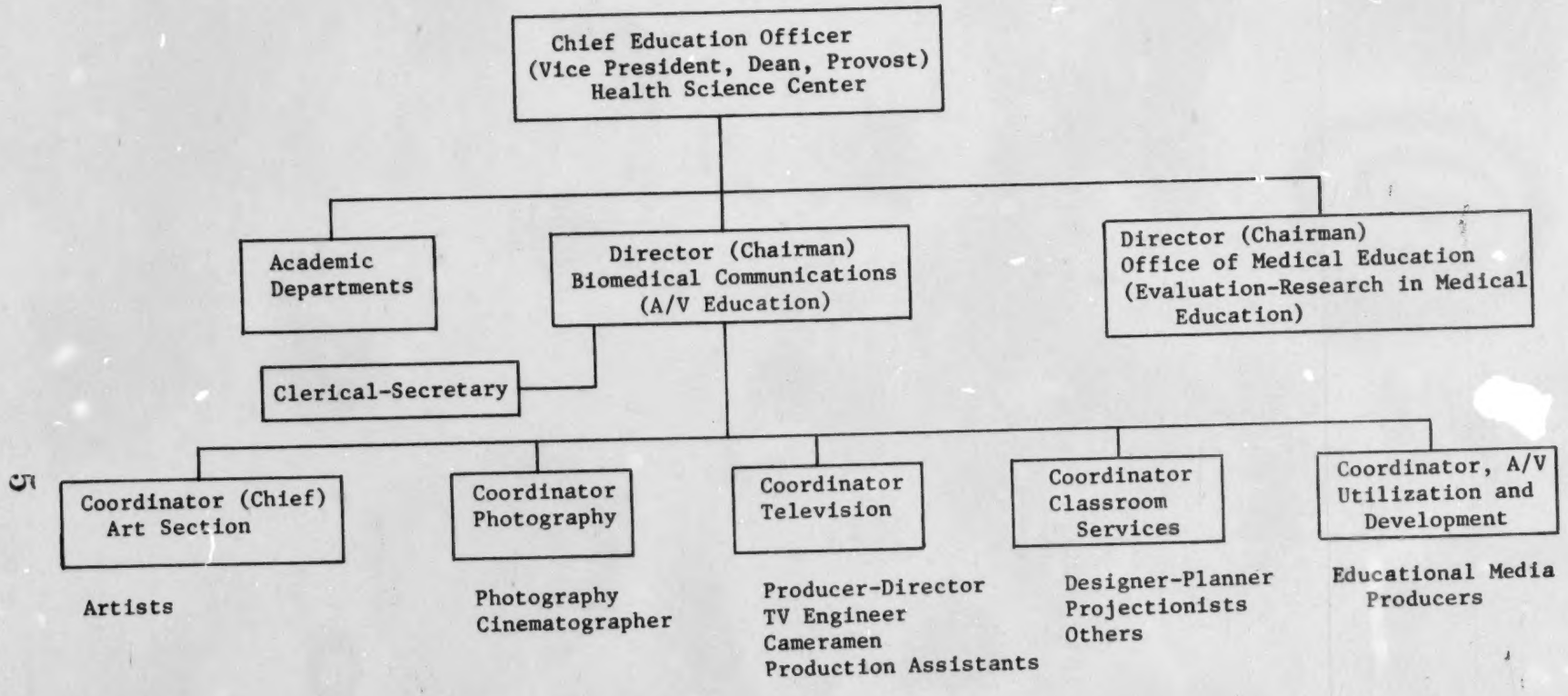

Figure 1

Organization: Biomedical Communications Department

STAFF

Biomedical communication departments are made up of professional, technical, and clerical personnel. The professional personnel are media generalists, having expertise in the design and production of all audiovisual materials. Although the professional may have extensive background, training, and experience in a specific area such as art, photography, or television, he will be able to design audiovisual materials which use all appropriate media. The technician will be capable of producing or assisting in the production of audiovisual materials in his own specialty area. In addition to their routine tasks, clerical workers will have knowledge of the language used by biocommunications personnel and the variety of media products. They will be acquainted with the facets of each kind of production so that they can answer questions regarding the stage of production of a specific piece. Finally, because they will be the most frequent contact between the audiovisual department and its clients for routine work, the clerical staff must reflect the best attitudes of the department.

Few formal training programs exist to produce biomedical communications personnel. Many schools have found that professionals with backgrounds in commercial or educational media can easily transfer their skills to biomedical communications. Technical personnel most often are recruited from established industrial and educational institutions. Several new programs have recently been established to provide training in biomedical communications: these include the Internship Program at the University of Nebraska Medical Center, the Ph.D. Program at the University of Cincinnati Medical Center, and the M.D.-Ph.D. Program at Duke University Medical Center.

Appendix I of this monograph consists of sample position descriptions of biomedical communications department personnel. These position descriptions are those used at Duke University Medical Center and are intended to serve as a general guide to those involved in employing media staff or in establishing positions for a new department. By relating manpower needs to salary levels, it is possible to arrive at a budget for personnel in a biomedical communications department.

BUDGET GUIDELINES

In order to determine the costs of operating a biomedical communications entity, it is necessary to take several budget items into consideration. These are personnel, hardware, supplies, auxiliary services, staff continuing education, and indirect (administrative and space) costs.

Personnel.

To begin a new enterprise, it is necessary to employ a leader and to employ staff support for his activities – a secretary, for example. In addition, of course, other technical and professional personnel must be employed immediately after the specific objectives of the new enterprise have been determined. For example, a biomedical communications entity will operate to support the three major programs of any health center – patient care, research, and education. In order to satisfy the requirements of these three major programs, then, it will be necessary to employ photographers and cinematographers for the patient illustration activities; illustrators (artists), photographers, and cinematographers for the research support activities; artists, photographers, cinematographers, and television production personnel to support the education activities. These kinds of people will then be prepared to answer requests by the health center's faculty and staff. They will probably not be able to share responsibility for specific teaching-learning experiences which are provided exclusively by the faculty and staff.

In order to participate directly, the biomedical communications enterprise must employ persons who will work to identify audiovisual and other nonprint materials which will meet the teaching-learning objectives of the health sciences center's programs. These nonprint materials may then be purchased or locally produced as appropriate. The support of the health sciences center's faculty and staff activities by the biomedical communications entity will then be two-pronged: guidance in the production of nonprint materials and guidance in the acquisition of non-print materials from outside sources.

Experience suggests that a basic staff might be:

Administration:
- 1 Director
- 1 Secretary

Still Media Production:
- 2 Photographers
- 1 Medical Artist
- 1 Graphic Designer

Motion Media Production:
- 1 Cinematographer
- 1 TV Producer-Director
- 1 TV Engineer
- 2 TV Technicians

Education:
- 1 Education Specialist
- 1 Instructional Designer

Media Library:
- 1 Librarian
- 1 Library Clerk

Audiovisual Services:
- 1 Audiovisual Technician
- 1 Projectionist

A staff of this size and composition will be able to support the health sciences center's activities at a minimal level in all facets of biomedical communications. If the center's biomedical communications objectives are not so sophisticated as to need all these kinds of personnel, a basic staff can be determined which will satisfy the limited objectives. For example, some centers have elected not to supply centralized classroom support in the form of audiovisual technicians, projection equipment, and projectionists. At other centers, the library includes nonprint materials in their acquisition, cataloging, storage, and circulation activities. Still other centers provide for instructional design and education specialist activities through present faculty and staff or through another entity involved in educational development and research. These last activities are a vital part of the biomedical communications enterprise, and there should be a very close relationship, if not a direct administrative link.

Following is a list of personnel positions and salary ranges as determined by a survey conducted by Algernon Allen of the Purdue University School of Veterinary Medicine and Lou Audette of the University of Connecticut Health Center at the October 27-28, 1971, Conference of Directors of Biomedical Communications in Atlanta at the National Medical Audiovisual Center. The extremes in salary for each position vary greatly. The average salaries, however, reflect the current market.

PERSONNEL SALARIES

Category	Position	Salary Average	Salary Range
Administration:			
	Director	18,751.00	(14,000-28,000)
	Administrative Assistant (Assistant Director)	11,246.00	(6,000-19,500)
	Secretary	6,220.00	(4,600- 9,200)
Art:			
	Chief Medical Artist	11,826.00	(5,200-19,000)
	Graphic Designer	7,833.00	(7,500- 8,000)
Computer:			
	Director	14,250.00	(13,500-15,000)
	Programmer	10,500.00	(8,500-13,000)
	Key Punch Operator	6,800.00	(5,200- 9,000)

Category	Position	Salary Average	Range
Education:			
	Education Specialist	13,590.00	(6,000-20,000)
	Technical Writer	9,500.00	(8,000-11,000)
	Instructional Designer	12,000.00	(8,000-16,000)
Library:			
	Senior Librarian	12,166.00	(11,000-13,000)
	Librarian	7,166.00	(5,200- 9,500)
	Clerk	7,300.00	(5,600- 9,000)
Photography:			
	Chief Medical Photographer	10,752.00	(7,200-14,400)
	Medical Photographer	8,580.00	(5,200-12,300)
	Dark Room Technician	6,656.00	(4,000- 9,400)
Services:			
	Audiovisual Technician	7,262.00	(5,000-12,000)
	Projectionist/Assistant	5,775.00	(4,000-10,700)
	Average Student Assistant Wages	2.00/hr.	(1.50-3.00/hr.)
Television:			
	Producer/Director	11,677.00	(7,500-16,500)
	Chief Engineer	12,189.00	(8,000-17,000)
	Technician	7,727.00	(5,000-12,000)
Cine Production:			
	Director-Cinematographer	14,000.00	(9,500-18,500)
	Assistant Director-Cinematographer	12,000.00	(8,500-16,000)
	Editor	12,000.00	(8,500-16,000)
	Technician	8,200.00	(7,000- 9,500)
Printing Shop:			
	Manager	14,000.00	
	Assistant Manager	11,000.00	
	Press Man	9,000.00	(8,200-10,400)
	Helpers	7,500.00	(7,100- 8,200)
	Compositors	9,500.00	(7,300-11,800)

In addition to salaries, personnel costs must include fringe benefits. These, of course, will relate directly to the institution's policies, and the costs may therefore vary from 10% - 20% of salaries.

Equipment.

A beginning biomedical communications enterprise will have to tool up for its activities. The level and sophistication of the instrumentation necessary to meet objectives will determine the original expenditures for equipment. Another factor, of course, is the sophistication to which the center aspires in local productions of nonprint materials. Biomedical communications equipment is available in astoundingly wide price ranges; the least expensive will perform adequately in many areas of endeavor. At the other extreme, however, the purchase of the most expensive equipment will add only a small degree of sophistication over equipment which is next lower in price.

Television equipment is the best example of the wide range of costs to achieve live and videotaped productions. A complete, monochrome two-camera and videotape recorder set-up can be purchased for as little as $2,500, or one may spend as much as $150,000. Color television production equipment comes somewhat higher in price but overlaps monochrome in the middle to high range. There is an inexpensive color television camera which is being advertised at $2,500. A system using this camera with a half-inch format videotape recorder and receiver will cost about $4,500. A two-camera system using this price level equipment may be obtained for about $12,000. At the other extreme, a two-camera with high-band, quadruplex videotape recorder and associated electronic gear (switcher-fader, distribution amplifiers, etc.) will cost about $250,000. And this price will not provide for classroom display receivers or the interconnecting cable system. Furthermore, a film chain, remote cameras for use outside the studio, along with a second recorder in order to perform electronic editing, may add another $250,000. Biomedical communications departments which lack this level of funding should not despair, however. Highly sophisticated color television cameras and recorders and intermediate electronic gear may be obtained for much less than the most expensive. For example, a color television camera which will produce high quality pictures may be obtained for about $25,000. Those included in the most expensive system sell for about $70,000. As times goes by and technology continues to develop, less expensive, but high quality, television equipment may become available. One should not wait for this, however; replacement of today's television gear may be less expensive than the original.

Photographic equipment, including motion picture cameras, does not vary in price as much as television equipment. However, professional photographic equipment is not cheap. A good rule of thumb is that any 35mm still camera with standard lens which costs less than $250 (list price) will probably not perform in the widest variety of ways. Again, a 35mm camera which does not permit lens interchangeability will probably not be suitable for the central facility which is charged with producing custom products. The other still camera formats should be considered for specific objectives. The 2¼" square format may be necessary to achieve a larger negative. These cameras (with lenses and accessories) vary in price from $800 to $1,700 and more. Copy camera systems are a necessary part of any medical illustration effort. These systems vary from $400 to $2,000.

Motion picture cameras are also a vital part of biomedical communications efforts. The 16mm motion picture camera system is most popular nowadays. Professional motion picture camera systems vary from $5,000 for silent work to $15,000 for single-system sound work. Other ancillary equipment (including editing and double-system sound conforming) may add $10,000 or more to the price.

The graphic art activities are probably the least expensive to equip. In addition, once equipped, many years will pass before additional expenditures will be necessary. Each artist can be equipped with a drawing table, drawing instruments, lettering devices, and other gear for about $1,000. In addition, it will be necessary to equip the artists with other machines such as a mounting press, a hot press for lettering, an embossograph device, and other equipment which more than one artist may use. These vary in price and set-up costs, but an additional $10,000 will fully equip the art section.

Administrative equipment such as desks, chairs, typewriters, calculators, etc., must also be added in the tool-up stage. And these items will vary in cost depending on the style in which the new department will be established. They are mentioned here only because this cost may be lost in the shuffle of acquiring the more glamorous items such as color TV cameras and recorders. The replacement of these items should be considered in continuing budgets along with the replacement of production equipment.

'To equip a beginning effort in biomedical communications, this author suggests that some figure between $50,000 and $350,000 be considered. It should be kept in mind that the lower figure will probably limit communications activities while the higher figure will require a greater number of personnel to operate.

In second year and onward budgets, repair and replacement costs for equipment becomes a necessary budget item. It is estimated that one should use 1% of the original cost of the equipment as an annual figure to purchase repair and replacement items to keep the equipment in good working order. In addition, new capital acquisitions can be rated at about 3% of the original cost of equipment. This last figure will purchase additional items but will not necessarily wholly replace the original equipment. It is suggested that all equipment be amortized in such a manner that each item may be replaced at the end of specified periods – 5-10 years being the usual amortization time.

Supplies

The biomedical communications department will use up expendible supplies at about 15%-25% of the cost of personnel. The variation in this figure is related to the activities of the department. For example, art and still photography supplies are relatively less expensive than are motion picture and television supplies.

Auxiliary Services

Telephone, telegraph, postage and express costs will amount to about 0.1% of the salaries. Obviously, this can vary depending on the nature of the activities during any specific year.

Staff Continuing Education

In the opinion of this author and of others in the field, it is essential that continuing education efforts be made for the biomedical communications staff. This continuing education can be in the form of participation in special workshops and meetings of the various professional organizations. One-half percent to one percent of the salary budget is a conservative estimate of these costs. Each department will have to determine what its budget needs are.

Indirect Costs

More and more, health sciences centers are examining their general administrative and space costs. Some institutions allocate these costs to their various components. These costs, then, become a budgeted item related to the expenditures necessary to maintain the biomedical communications component. By suggesting that these costs may vary from 15% to 45% of salaries, this author is taking the figures negotiated by institutional administration with private and Federal sources of grant and contract funds.

Budget Derivation

As noted above, the director of biomedical communications should report to the chief educational administrative officer of the institution. Therefore, the budget will be derived from this office. In this way, the biomedical communications enterprise will compete with the first-line departments for its share of the institutional dollars, and the institution will thus indicate its commitment to biomedical communications.

There are a number of ways in which the institution may operate the budgetary matters of the biomedical communications department. These methods may vary from fully funded departments which derive all of their budget through the administration to departments which recover all of their expenditures. In general, the fully funded department will support the programs of the health sciences center and keep a wide variety of records to demonstrate the scope and direction of their activities. The defense of their budget will be entirely dependent on these records. The department which recovers its expenditures will have this added data to support its budget requests. In general, the fully funded department will estimate its needs for personnel and material resources and then expend these to support the programs of the health sciences center. At the other extreme, the department budgeted by the "wash-out" method will also estimate its needs, budget accordingly, but then it must bring in as many dollars as it spends. Both kinds of budgeted departments will cover some of their expenditures by activities under grants and contracts for specific projects.

The purpose of this paper is not to argue the merits of either system. However, it should be noted that there are advantages in both, and many health sciences centers combine the two budget systems.

A beginning biomedical communications enterprise will need to be fully funded in order to be able to properly tool up to meet the objectives of the principal programs of the health sciences center. They need the security given by full institutional funding to be able to seek out the ways in which they can best serve the local education, patient care, and research scene. This can only be done by full support during the formative years.

There are some aspects of the biomedical communications activities which can be placed on a recovery budget relatively soon. In general, these are the still photographic and graphic arts activities. Routine television and motion picture activities may also be placed on the recovery budget system. The areas which may never be possible to recover by fee-for-service are those areas which interdigitate closely with educational development. Consultation, experimentation, faculty relationships including workshops, and other developmental work are some of these developmental activities. It may be impossible to establish a dollar figure for these activities in single-instance cases. Therefore, except for large-scale projects, these activities should be covered in the same manner in which individual faculty preparation for teaching is covered. That is, there should be recognition that these are a part of the total endeavor and that the expense of these activities is an administrative/scholarly responsibility of the institution. The recommendation of this author is that the basic staff of the biomedical communications department be funded in such a manner that recovery of expenditures not be required. On the other hand, expenditures for those areas which can be identified as direct service probably should be recovered. However, the local situation must ultimately determine the methods used for budgetary purposes.

Cost effectiveness of all the activities of the biomedical communications department should be a first priority for the leaders. Of all of the methods used to determine cost-effectiveness, one must also ask: How well the materials (produced and otherwise acquired) fit the objectives of the user; whether the students use the materials on an elective basis for learning in preference to other materials available; whether the student learning time is lessened, or whether more learning takes place, and whether these materials make possible more direct student-teacher interaction. All of these and more should be considerations in identifying cost-effectiveness. Each institution must set up its own standards.

A vital part of the activities of the biomedical communications department is the development of new methods and the support of institutional programs in more sophisticated ways. These activities will possibly be funded by outside-institution funding – grants and contracts from Federal and private sources. Proposals will probably be initiated in cooperation with other departments and by the biomedical communications department alone. In any case, this kind of funding will make the difference between a vital, healthy, progressive department and one which is passive, regressive, and neglected. The biomedical communications department in the health sciences center can be a vital force in supporting the principal programs of the center in such a manner as to enhance these programs and their objectives. The budget and the budgetary mechanisms should reflect the vital role of the biomedical communications department.

SURVEY OF FUNDING PRACTICES

Twenty-three institutions which have centralized biomedical communications departments were surveyed by this author to gather the data shown in Figure 2. Data for each department were current for the 1972 fiscal year. Only those activities common to all departments have been listed. Art, photography, and television services comprise the Support Total and Recovery Total categories. Classroom services was the only other program engaged in by all departments. Development of curriculum, utilization concepts, and research in medical education were not included in any school's report.

Only three schools (j, s, w) and one hospital (m) reported that they are required to recover 100% of expenditures. Even so, one of these schools (s) supported the A/V Director's office.

Only two departments (j and m) are required to recover their total indirect costs. Although one (k) is required to recover 60% of its indirect costs, it does support the Director's office. None of the other A/V Departments is required to recover the indirect costs of their facilities.

Classroom services such as projection and television videotape playback are generally supported by the institution; only two schools (g and w) recover a portion of this cost.

All of the departments operate at a deficit. Even the three washout operations, i.e., income offsets expenditures, occasionally report deficits.

Comments made by the respondees included: "We are an educational function, and in educational institutions, we should be supported directly." "It is fair to charge for services, but the routine customers should not have to pay for the special work requested, nor should the mass of customers be made to pay for special consultation and for ancillary educational activities." "It is just great to have the independence of a self-supporting department, but it would be fine to have some support to engage in developmental work."

The question of whether to charge for services has been answered in a wide variety of ways. In general, every school charges to some extent, up to 100%, for those services which can be easily identified as unitary, e.g., photographic negatives, prints, slides, charts, graphs, drawing, and so forth. Television services (videotape recordings) and motion picture services are also charged for in a variety of ways. The generalization can be made that a budgetary mechanism has been established in every school to cost-allocate funds, be they internally or externally derived. In those schools which recover 100% of their communications expenditures, the accounting mechanisms include the capability to charge specific sums to specific fund codes. In those schools where less than 100% is recovered, the accounting procedures are performed by the communications department itself and in turn by the central administration. Whether or not a 100 percent fee-for-service is charged, the communications department should make its own time-motion-procedure study to determine actual costs. In this way, the department can justify its cost-effectiveness and, thereby, compete successfully with other departments for the available dollars. Those directors of biomedical communications who are not bound to a 100% recovery budget still perform all of the procedures necessary to justify

FIGURE 2
SURVEY OF AUDIOVISUAL FUNDING PRACTICES, March 31, 1972

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Schools Surveyed:																							
No. of Personnel:	10	29	–	40 *(+10 part-time)	–	17	–	19	–	23	–	6	5	15	10	14	22	–	8		28	3	26
% Support Total	75	8	15	60		40	82.1	100	100	-0-	40	35	-0-	29	–	62.5	55	80	-0-	90	66.7	30	-0-
% Recovery Total	25	92	85	40		60	17.9	-0-	-0-	100	60	65	100	71	–	37.5	45	20	100	10	33.3	70	100
% Support Classroom Services	–	–	–	100		–	70	100	100	-0-	100	–	–	–	–	–	–	–	–	100	100	100	22
% Recovery Classroom Services	–	–	–	-0-		–	30	-0-	-0-	100	-0-	–	–	–	–	–	–	–	–	-0-	-0-	-0-	78
% Support Indirect Costs, Rent, Utilities	100	100	100	100	100	100	100	*100	100	-0-	40	–	-0-	100	100	100	100	100	100	100	100	100	100
% Recovery Indirect Costs, Rent, Utilities	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	100	60	–	100	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Direct Grant Support	-0-	-0-	+	–	–	+	+	–	–	-0-	-0-	+	-0-	–	–+	–	–	–	-0-	-0-	-0-	–	+
Indirect Grant Support	+	+	+	–	–	+	+	–	–	+	+	–	-0-	–	–	–	–	–	-0-	–	+	–	+
% Support Director's Office	–	100	–	–	–	40	100	100	100		100	–	-0-	–	–	–	100	100	100	100	100	100	-0-
% Recovery Director's Office	–	-0-	–	–	–	60	-0-	-0-	-0-		-0-	–	100	–	–	–	-0-	-0-	-0-	-0-	-0-	-0-	100
Profit operation																							
Deficit operation	D	D	D	D	D	D	D	D	D	W**		D	W**	D	D	D	D	D	D	D	D	D	W**
Washout operation																							

* Plus 10 part-time
** Slight or occasional deficits reported
– Indicates no information or item not separately reported

the expenditures of their departments and should recognize the necessity for the unit to be cost-effective.

When one is figuring personnel costs, he should realize that salaries and fringe benefits cannot be divided by total number of work hours to arrive at a realistic hourly rate. Time consumed by vacations, sick leave, paid holidays, leave time to attend professional meetings, daily coffee breaks, record keeping, and maintenance of work instrumentation must first be subtracted from total work hours. Thus, the number of *effective* work hours is reduced from 2080 to approximately 1400, making the worker directly productive about 65% of the time. In addition, when administrative overhead is added to the cost, the hourly rate for actual work might become as much as twice the amount paid to the worker.

APPENDIX I. POSITION DESCRIPTIONS

DIRECTOR, BIOMEDICAL COMMUNICATIONS

Work Performed

Plan, direct and coordinate biomedical communications activities in providing medical illustration, photographic, and motion media materials and services in support of the University Medical Center research and teaching programs and patient care.

Maintain interface with Medical Center faculty to determine needs and application of audiovisual support; develop and implement research and experimental audiovisual methods.

Direct and coordinate the establishment of schedules, task assignments, and allocation of man hours and equipment to ensure compliance with departmental commitments.

Determine fiscal requirements and prepare budgetary recommendations; monitor expenditure of budgeted funds.

Prepare reports and analyses setting forth progress recommendations or conclusions.

Plan and conduct meetings with subordinates.

Direct various personnel functions including hiring, merit recommendations, and promotions.

ASSISTANT DIRECTOR, BIOMEDICAL COMMUNICATIONS

Work Performed

Coordinate and participate in the production of art, motion media, and still photography for use in teaching, research, and patient care activities.

Supervise art and photography personnel to ensure adequate manning, proper distribution of assignments, and high levels of workmanship.

Advise director of current project status and make recommendations for the resolution of problems and the development of new policies and procedures.

Establish and maintain adequate prices for photography, motion media, and art work.

Provide information and assistance to faculty and students regarding the application of audiovisual materials and methods.

Assist in the preparation of budgetary recommendations; maintain records and prepare reports reflecting operational data, material utilization, equipment needs, and related information.

Assist the Director in the administration of personnel functions and assume the duties and responsibilities of the Director in his absence.

COORDINATOR, MOTION MEDIA

Work Performed

Coordinate and participate in the production of motion media to include live and videotaped television programs and motion picture films.

Direct live and videotaped television programs to include coordinating production, programming, and engineering activities.

Maintain liaison between physician or instructor and technical staff concerning program planning and preparation.

Maintain records reflecting services rendered, status of films in progress, and inventory of productions.

Plan and schedule work for the group.

Make recommendations on personnel actions.

Evaluate new equipment, films, and techniques.

Monitor expenditure of budgeted funds; coordinate the billing of clients.

EDUCATIONAL MEDIA PRODUCER

Work Performed

Confer with faculty members on requests for audiovisual media; determine and analyze needs and make appropriate recommendations.

Coordinate production of slide series, motion picture films, videotapes, and other media materials for use by faculty in teaching activities.

Plan and participate in educational workshops to provide information and assistance to faculty and students regarding the application of audiovisual materials and methods.

Maintain an audiovisual library utilization and loan program for faculty and students.

CHIEF, TELEVISION ENGINEER

Work Performed

Maintain all television equipment in the Department of Biomedical Communications.

Make decisions regarding technical electromechanical matters.

Share decisions with the Coordinator of Medical Television.

Recommend acquisition of new equipment and hiring of engineering personnel to the Television Coordinator.

Schedule engineering personnel, plan technical aspects of TV productions, experiment with and evaluate new items of electronic equipment, and prepare technical reports for the Coordinator of Medical Television and the Director of the Division.

Exercise responsibility for technical facets of television.

Make recommendations to the Coordinator of Medical Television for selection, discipline, and reduction in force of electronics technicians.

Analyze engineering aspects of television.

Originate recommendations for technical improvements.

Compare and evaluate equipment for possible acquisition.

COORDINATOR OF MEDICAL ART

Work Performed

Provide art resources for teaching, patient care, research, and public information.

Serve patients through the design and production of facial prostheses, cranioplasties, cosmetology, and epidermal injections with insoluble pigments.

Recruit and train medical artists and graphic artists.

Supervise the daily functions of his section.

Determine use of equipment and space and assignment of personnel in his section.

Make recommendations regarding recruitment and separation of personnel.

MEDICAL ILLUSTRATOR

Work performed

Perform complex medical illustration work in the preparation of technically correct drawings, diagrams, and models to illustrate medical and surgical findings and procedures for use in exhibits, publications, and research and teaching activities.

Draw illustrations for medical papers, books, and publications from observations, ideas, and rough drafts of others.

Evaluate and recommend new methods, materials, and equipment for use in medical illustration.

Lay out and letter graphs, charts, and diagrammatic drawings.

ARTIST ILLUSTRATOR

Work Performed

Perform a variety of duties involved in the design, layout, and paste-up of brochures, pamphlets, bulletins, programs, and other printed material in accordance with customer's request. Prepare type headings to specified size and style.

Discuss printing needs with customer and prepare specifications to include type styles, column width, and point size for preparation of typed copy.

Lay out and letter charts, tables, and graphs using drafting and art tools and equipment.

Prepare illustrations and drawings in a variety of media such as crayon, water color, and pen and ink.

Design and prepare posters for displays and exhibits.

MEDICAL PHOTOGRAPHY SUPERVISOR

Work Performed

Supervise, coordinate, and participate in the photography of patients, anatomical structures, pathological specimens, surgical techniques, and other subjects for scientific publications, records, research, and teaching activities.

Supervise developing of film, making of prints and production of slides from charts, books, and slides for teaching purposes.

Originate new photographic methods and techniques to obtain results when standard techniques are inadequate.

Ensure maintenance and proper functioning of assigned photographic and related equipment.

Maintain inventory of photographic supplies and equipment; reorder as required.

Provide technical guidance and instruction to faculty and staff in medical photography techniques and procedures.

SENIOR MEDICAL PHOTOGRAPHER

Work Performed

Photograph patients, anatomical structures, pathological specimens, complex surgical techniques, and related subjects involving specialized photographic procedures to include fundus, cine, fluorescent, and microscopic photography.

Develop film, make prints, and produce slides from charts, books, and slides to be used for teaching purposes.

Develop new photographic methods and techniques to achieve desired results.

Prepare photographic processing solutions, retouch prints, and perform layout tasks as required.

Provide technical guidance and instruction to members of the faculty and staff in medical photography techniques and procedures.

MEDICAL PHOTOGRAPHER

Work Performed

Photograph patients, anatomical structures, routine surgical techniques, and other subjects for scientific publications, records, and research and teaching activities.

Prepare reduced, enlarged, or true copies of charts, graphs, illustrations, X-rays, slides, equipment, and specimens.

Develop film and make prints and slides according to stated number, stock, size and other film order specifications; plan and prepare illustrations for publications, exhibits, research, teaching, and related purposes.

Retouch prints and perform layout, mounting, cutting, and identification tasks as required.

Prepare dyes, solutions, chemicals, and other reagents used in photographic processing.

TELEVISION ENGINEER

Work Performed

Perform a variety of specialized technical tasks to include operating and maintaining television studio electronic equipment in accordance with established operating procedures and FCC rules and regulations.

Coordinate studio engineering activities with production and programming operations.

Monitor picture and sound being transmitted, recorded, or played; make necessary adjustments to maintain quality.

Perform maintenance, repairs, and adjustments on transmitter equipment, television cameras, audio equipment, lighting, and associated studio equipment to ensure proper functioning; design and modify electronic and television equipment as required.

Assist in the determination of requirements for audiovisual equipment and facilities for new construction and renovation.

TELEVISION TECHNICIAN

Work Performed

Perform a variety of technical tasks to include operating, maintaining, and repairing television equipment in accordance with established operating procedures and FCC rules and regulations.

Perform maintenance, repairs, and adjustments on television cameras, audio and studio equipment, and associated electronic equipment to ensure proper functioning.

Maintain library of videotapes; make arrangements to show tapes as requested.

Maintain logs of television programs distributed, equipment checked out and returned, and hours of audio taping.

AUDIOVISUAL SPECIALIST

Work Performed

Coordinate and participate in a variety of technical tasks involved in the operation of motion picture cameras and television control and recording equipment; edit a variety of videotape and motion picture film; direct the filming of both live and videotaped programs as required.

Schedule the use of classroom audiovisual display devices to include slide and film projectors, tape recorders, and videotape equipment; operate display devices as required.

Advise Medical Center faculty and staff regarding application of audiovisual equipment and methods.

AUDIOVISUAL TECHNICIAN

Work Performed

Perform a variety of routine technical tasks involved in the operation of classroom audiovisual display devices to include slide projectors, motion picture projectors, opaque and overhead projectors, display screens of various kinds, and television receivers.

Select proper projection equipment and lens for the specified classroom situation; deliver and setup appropriate equipment in class or lecture rooms; project slides or motion pictures as requested by instructor or lecturer.

Maintain records of projection work.

Provide training in the operation of slide and film projectors to faculty, staff, and students as required; assist in the training of new personnel.

SECRETARY

Work Performed

Perform secretarial and related work to assist and relieve administrative personnel of clerical duties. Take and transcribe dictation, type letters, reports, records, stencils, and other related forms from rough drafts, corrected copy, dictated notes, or transcribing machine recordings, requiring initiative and judgment to plan, organize, and set up in proper form.

Compile information, prepare regular or special reports on departmental activities,

maintain departmental personnel records and provide necessary documents for staff member's use in meetings.

Answer telephone, take messages, and reply to questions in accordance with general instructions. Transmit instructions or information to and from staff members. Schedule meetings, arrange appointments, and make travel reservations as requested.

CLERK TYPIST

Work Performed

Perform routine clerical and typing tasks involved in processing varied office materials such as form letters, requisitions, memoranda, and reports or summaries.

Verify information against existing records; post information to records or ledgers; issue equipment or supplies.

Tabulate cumulative data; type scheduled or special reports as required.

ACCOUNTING CLERK

Work Performed

Perform a variety of clerical accounting tasks in maintaining financial records and processing related data, including posting data to journals and ledgers, making verifications, and running trial balances.

Assist in maintenance of accounts receivable ledger; operate a posting machine and various other office equipment.

Compile various financial statements and reports involving some arithmetical computations.

Assist in the preparation of special accounting reports for administrative utilization.

APPENDIX II. FORMS

The operational procedures which any viable communications department institutes must include a number of forms for the purpose of making purchases, for keeping records of its work, and for billing its clients. The forms which make up Appendix II are some of those which are used by the Division of Audiovisual Education at Duke University Medical Center. They are given here only as examples; obviously, it will be necessary for each biomedical communications enterprise to produce its own forms.

Purchase Forms

Form No. 1 is a purchase requisition supplied by the purchasing department and is used to request supplies to be used by the audiovisual department. Form No. 2 is used by the audiovisual department to keep an inventory of its supplies. No. 3 is a special form to account for the inventory and disposition of videotape stock.

Billing Forms

Form No. 4 is used to bill for personal work or work performed for agencies outside the university. No. 5 is the form most used to account for services rendered to departments and individuals using university fund codes to obtain these services and materials.

Records Forms

Form No. 6 is a page from each artist's notebook on which he keeps a record of the work performed. No. 7 is a work log used by the photographers to keep records of all kinds of still photography except that of patients. No. 8 is a card to keep records of each videotape recording produced. When a videotape has been erased, the card will be so marked and maintained in a file. The person's name who authorized the erasure will also be noted. Form No. 9 is for classroom service requests and is also used to produce the weekly classroom service schedule. No. 10 is used to maintain records of motion picture productions. The status of any film production can be determined at any date. No. 11 is the form used to record television production orders and billing inventories. Some of the data recorded on this form will be transferred to Form No. 5, the interdepartmental request form.

Forms 12, 13, and 14 are monthly report forms to reflect the activities of the various sections of the audiovisual department. Each month these forms are reviewed by the Coordinators and the Director of the Division. Comparisons can be made of, for example, the activities of any one month in a year with those of the same month in previous years. Trends reflecting total production or changes in number and quality of requests can be identified. This form is very useful for budget planning.

23

FORM DA 29A
50M 9-71

PURCHASE REQUEST

REQ. No. 3643

THIS IS NOT AN ORDER

A SEPARATE SHEET SHOULD BE MADE OUT FOR EACH CLASS OF GOODS.
ALL SUPPLIES AND MATERIALS MUST BE ORDERED BY THE PURCHASING DEPARTMENT OF DUKE UNIVERSITY

SUGGESTED SOURCES WELCOMED

PREVIOUS ORDER NO.

SHIP TO: DUKE UNIVERSITY

care of: _____ ROOM # _____

DEPT. NAME _____

BUILDING _____ P.O. BOX _____

REQ. NO.	REQUIRED DELIVERY DATE	CHARGE CODE (S)	EQUIP. CODE	WORK ORDER
3643				

QUANTITY	UNIT	DESCRIPTION Accurate and complete specifications will avoid delay.	ESTIMATED COST	DO NOT WRITE IN THIS COLUMN

THIS IS NOT AN ORDER

Signed By _____ Date _____ Approved By _____ Date _____

DO NOT WRITE BELOW THIS LINE

PURCHASING USE ONLY

SHIP VIA	F.O.B.	TERMS	VENDOR CODE	AREA	REQUIRED DELIVERY DATE

VENDOR	SHIP POINT OTHER THAN ABOVE

PURCHASE ORDER NO. _____ Buyer's Approval _____ Date _____

INSTRUCTIONS
1. Do not mail this to vendor. Mail to purchasing. 2. Attach quotations or justification for sole source on all purchases. This is a Federal Government requirement. 3. Fill out all areas of the requisition complete and correctly. This will facilitate your receipt of material. 4. If equipment requires installation please obtain work order number from maintenance and place in appropriate space on requisition. 5. If you have any questions PLEASE call purchasing.

ORIGINAL

Form 1.

24

ITEM: _____

SOURCE: _____ YEAR _____

1	2	3	4	5	6	7	8	9	10	11	12
ON HAND	REORDER WHEN DOWN TO	✓	REORDER QUANTITY	✓	DATE ORDERED	DATE REC'D	AMOUNT REC'D	BACK ORDER	DATE COMPLETE	REQ. # P.O. #	MONTHS
											J
											A
											S
											O
											N
											D
											J
											F
											M
											A
											M
											J
											RECAP

Person taking inventory must complete Column 1. If Column 1 is smaller than Column 2, place a check (✓) in Column 3.
---Columns 4 through 11 for secretarial use
---Check (✓) Column 5 when requisition is typed
**REORDER ALL ITEMS WITH CHECK(✓) IN COLUMN 3

Form 2.

CENTRAL TELEVISION FACILITY — VIDEOTAPE DISPOSITION INVENTORY

ARRIVAL DATE	FORMAT	PATCH NUMBER	PO NUMBER	VENDOR	UNIT COST	DISPOSITION

Form 3.

DIVISION OF AUDIOVISUAL EDUCATION

DUKE UNIVERSITY MEDICAL CENTER

DURHAM, N. C. 27710

DATE _____ _____ _____

$ _____

Credit Code #

DATE OF SERVICE	DESCRIPTION	BALANCE

PLEASE MAKE CHECK OR MONEY ORDER PAYABLE TO
DUKE AUDIOVISUAL EDUCATION

Form 4.

I R I FORM

DUKE UNIVERSITY

INTERDEPARTMENTAL REQUEST AND INVOICE

NO. IR 289604

1. REQUEST TO

DEPARTMENT RENDERING SERVICE _____ DATE _____

2. INITIATOR OF REQUEST FOR SERVICE

INVOICE TO:

DEPARTMENT OR PRINCIPAL INVESTIGATOR _____ AUTHORIZED SIGNATURE _____

ADDRESS _____ DUKE CODE TO BE CHARGED _____

TELEPHONE NO. _____ DATE REQUIRED _____ DATE CODE EXPIRES _____

MATERIALS and/or SERVICE REQUESTED

3. QUAN.	4. UNIT	5. DESCRIPTION	6. UNIT PRICE	7. AMOUNT
				$

8. FOR SERVICE DEPARTMENT'S USE

9. INVOICE DATE _____

REFERENCE NO. _____

10. TOTAL AMOUNT OF INVOICE $

11. $ _____ ENCUMBRANCE

SERVICE DEPARTMENT:
TO ENCUMBER THE ESTIMATED COST OF THIS REQUEST, FORWARD THE FIFTH COPY TO THE ACCOUNTING DIVISION, 304 ALLEN BUILDING IMMEDIATELY. (INSTRUCTIONS ON BACK OF FIFTH COPY)

FORM DA 41
50M 4/71

NO. IR 289604

ORIGINAL

Form 5.

27

ARTIST _____ FROM _____ TO _____

Received	From	Phone	No.	Type of Work	Art Due	Photo Due	Charge

Form 6.

WORK LOG - OTHER THAN PATIENTS

JOB NO.	DATE	NAME	DEPT.	TYPE	REC'D	TAKEN	D/R	ASBL'D	DEL.

Form 7.

28

Central Television Facility VTR CONTENT DIGEST
Duke University Medical Center

PRODUCTION TITLE: _____

TAPE NO. _____ DATE _____ LENGTH _____

TALENT _____ DIRECTOR _____

SUBJECT (SYNOPSIS): _____

_____

Form 8.

DIVISION OF AUDIOVISUAL EDUCATION
PROJECTION SERVICES & LOAN RESERVATIONS
M-402 DAVISON EXT. 3748

NAME OF RESERVER: _____

PERSON TO USE EQUIPMENT: _____

DEPARTMENT: _____

DATE NEEDED: _____

TO BE RETURNED: _____

DELIVERY & PICK UP: YES_____ NO_____

OPERATOR: YES_____ NO_____

WHERE IS THE EQUIPMENT TO BE USED OR DELIVERED: _____

TYPE OF EQUIPMENT:

AUTO FILMSTRIP	_____	NUMBER: _____
2x2 (FILMSTRIP)	_____	NUMBER: _____
3 1/4 x 4	_____	NUMBER: _____
MICRO. PROJECTOR	_____	NUMBER: _____
OPAQUE	_____	NUMBER: _____
16mm PROJECTOR	_____	NUMBER: _____
OVERHEAD	_____	NUMBER: _____
SCREEN	_____	NUMBER: _____
OTHER	_____	NUMBER: _____

REMARKS:

DATE RETURNED: _____

CONDITION OF EQUIPMENT: _____

I HAVE CHECKED THE ABOVE EQUIPMENT AND ACCEPT RESPONSIBILITY FOR ANY LOSS OR DAMAGE TO THIS EQUIPMENT OTHER THAN NORMAL OPERATION WEAR. (BULBS, DRIVE BELTS, ETC.)

SIGNATURE: _____

AUDIOVISUAL REPRESENTATIVE: _____

DATE: _____

RETURN ALL EQUIPMENT TO ROOM 402 DAVISON BUILDING AS SOON AS POSSIBLE. THANK YOU.

Form 9.

PRODUCTION TITLE or
PATIENT NAME and NO. | REQUESTED BY: | JOB NO.

TIME: | LABWORK---SPECIFY:

DATE	FILM I.D.	FOOTAGE	CAMERA 1	CAMERA 2	PROD. DIR	EDIT.	TTLG.	ANIM.	PROCESS OUT	PROCESS IN	WRK PRT OUT	WRK PRT IN	MASTER OUT	MASTER IN	RLS PRT OUT	RLS PRT IN	DATE COMP
TOTALS:										ft		ft		ft		ft	
		@ /ft	@	@	@	@	@	@	@	/ft	@	/ft	@	/ft	@	/ft	

OTHER: _____

_____

DISPOSITION OF ORIGINAL: _____ PRINTS: _____

_____ _____

Form 10.

CENTRAL TELEVISION FACILITY - Division of Audiovisual Education
Duke University Medical Center

PRODUCTION ORDER AND BILLING INVENTORY

NAME OF CALLER:_____DEPT._____DATE:_____

PRODUCTION
DATE REQUESTED:_____TIME:_____CHARGE TO:_____

A. Services Required: ( )VTP ( ) VTR ( )LIVE ( )VTE ( )ATP ( )ATR

LOCATION:( )Studio_____ _____ _____ _____ _____ _____

TAPE NO:_____TITLE:_____

PATIENT:_____TALENT OR INSTRUCTOR:_____

B. Equipment:( )____I.O.CAMERA(S) ( )____VIDICON(S) ( )SCANNER____( )REMOTE CART

( ) SLIDES____SIZE:_____( )FILM ( )OTHER:_____

C. Services Provided: ( )STUDIO ( )REMOTE

1. Set-up time:_____min @ $_____/hr. .....$_____

   Stand-by: _____min @ $_____/hr. .....$_____

   Break-down: _____min @ $_____/hr. ..... _____

2. Camera Transmission: _____Camera(s) ..... _____

   _____min. @ $_____/hr. ..... _____

3. ( )Audio ( )Video Tape Editing:_____min. @_____/hr. ..... _____

4. Video Tape Inserts: _____min. @_____/hr. ..... _____

5. ( )Audio ( )Video Tape Playback:_____min. @_____/hr. ... _____

6. ( )Audio ( )Video Tape Recording:_____min. @_____/hr. ... _____

7. Multiscanner Inserts:_____min. @_____/hr. ..... _____

8. Projection Service:_____min. @_____/hr. ..... _____

9. Engineering Assistance:_____min. @_____/hr. ..... _____

10. Parts (list attached): ..... _____

11. Video Tape Stock: _____hrs. @_____/hr. ..... _____

12. Art Work: ..... _____

13. Photography: ..... _____

14. Subject-talent Imbursement: ..... _____

TOTAL ..... _____

Form 11.

31

DIVISION OF AUDIOVISUAL EDUCATION

Medical Art _____ to _____ 19__

DEPARTMENT	AIR BRUSH	ANIMATION	CHART	DESIGN	D.R. GRAM	DIAZO	EMBOSSOGRAPH	GRAPH	HALF TONE	LETTERING	MATTING	MECHANICAL	MISC	MODEL	MOUNT	O.H. SKETCH	PEN & INK	SKETCH							EXHIBIT NO	EXHIBIT HRS	ART-IST	COST	PERSONAL
ANATOMY																													
ANESTHESIA																													
BACTERIOLOGY																													
BIOCHEMISTRY																													
BRACE SHOP																													
DERMATOLOGY																													
ENDOCRINE																													
E.N.T.																													
EXP. SURGERY																													
EYE																													
FPU																													
HOSPITAL																													
IMMUNOLOGY																													
MEDICAL SCHOOL																													
MED. SCHOOL LIB.																													
MEDICINE																													
NEUROLOGY																													
NEURO SURGERY																													
NURSING																													
OB. & GYN.																													
ORTHOPEDICS																													
PATHOLOGY																													
PEDIATRICS																													
PERSONAL																													
PHYSICAL THER.																													
PHYSIOLOGY																													
PLASTIC																													
PSYCHIATRY																													
SPEECH																													
SURGERY																													
T. SURGERY																													
UNIVERSITY																													
UROLOGY																													
X-RAY																													
ITEM TOTALS — NO. OF REQUESTS																													
ITEM TOTALS — AVG. UNITS	10	4	3	5	2	1	1/2	1	4	20	1/6	1/2	6	1/2	15	2	1/12	2	10	1/2								GRAND TOTALS	
ITEM TOTALS — NO. OF HOURS																													

MONTHLY TOTAL = UNITS _____ HOURS _____ CHARGES _____

Form 12.

DIVISION OF AUDIOVISUAL EDUCATION

Central Television Facility _____ To _____

DEPT	AUDIO TAPE HOURS					VIDEO TAPE HOURS					LIVE TV HOURS				PROJECTION HOURS				SPECIAL SERVICES		CHARGE FOR SERVICES							TOTALS		
				Dub					Record										Project (List)	Hours	Audio Tape		Video			Projection		Spcl Svcs	Hours	Charges	
	Play	Recd	Magna	Dicta	Reel	Play	Edit	Dub	Stud	Rem	Class	Disp	Lab	Other	Film	Slide	TV	Serv			Play	Recd	Play	Recd	Live	All	Serv				
Anatomy																															
Anesthesia																															
Bacteriology																															
Biochemistry																															
Center Study Aging																															
Clinical Microscophy																															
Community Health Sci																															
E N T																															
Physcian's Asst Prog																															
Med School Library																															
Medicine																															
Behavioral																															
Cardiology																															
Endocrinology																															
Neurology																															
Microbiology																															
Ob & Gyn																															
Opthalmology																															
Orthopedics																															
Pathology																															
Pediatrics																															
Physical Therapy																															
Physiology																															
Pharmacology																															
Plastic																															
Psychiatry																															
Human Behavior																															
Medical Sociology																															
Psychosomatic																															
Psychology																															
Radiology																															
Surgery																															
Urology																															
Med School Admin																															
Nursing School																															
Public Relations																															
Personal																															
TOTAL																															
GROUP																															
CUM																															

Form 13.

DIVISION OF AUDIOVISUAL EDUCATION

Medical Photography _____ to _____ 19___

SERVICE _____

Page No. _____

DIAGNOSIS	NEGATIVES						PRINTS				COLOR										MOVIES			POLAROID				OTHER			CHARGES	
	PAT	SPEC	COPY	FUND	PHOTO MIC	POSE	PT	C	LANT SL	DIAZO	OR	BT	SPEC	COPY	FUND	LANT SL	PHOTO MIC	PRINT	PROC		FEET	ED. HR.	LAB	NEG.	B/W PRINT	COLOR PRINT	LANT SL				LABOR	COST
ANATOMY																															
ANESTHESIA																															
BACTERIOLOGY																															
BIOCHEMISTRY																															
BRACE SHOP																															
DERMATOLOGY																															
ENDOCRINE																															
E N T																															
EXPERIMENTAL SUR																															
EYE																															
F.P.U.																															
HOSPITAL																															
IMMUNOLOGY																															
MEDICAL SCHOOL																															
MED. SCHOOL LIB.																															
MEDICINE																															
NEUROLOGY																															
NEURO SURGERY																															
NURSING																															
OB. & GYN																															
ORTHOPEDICS																															
PATHOLOGY																															
PEDIATRICS																															
PHYSICAL THERAPY																															
PHYSIOLOGY																															
PLASTIC																															
PSYCHIATRY																															
SPEECH																															
SURGERY																															
T. SURGERY																															
UNIVERSITY																															
UROLOGY																															
X-RAY																															
PERSONAL																															
PRIVATE IN																															
PRIVATE OUT																															
STAFF IN																															
STAFF OUT																															
UNIT	TOTAL																														
GROUP																															
GRAND																															

Form 14.

5F5414773